

Bryan Alexander

Web 2.0 and Emergent Multiliteracies

Students are, increasingly, digital content producers, and participate extensively in evolving online social networks. The emergence of the former represents subtle changes in students' experience of images, audience, copyright, ownership of learning, and technology. Experiencing the latter places students in an awkward position in terms of pre-Web conceptions of social space, and especially concerning privacy and expression in a highly visual environment. This article considers how pedagogies confront emergent Web 2.0 habits, and situates them in the context of other architectures to represent very different models for information architecture, intellectual property, software development, gaming, and learning.

Bryan Alexander is the director of research for the National Institute for Technology and Liberal Education (NITLE).

Correspondence should be addressed to Bryan Alexander, 753 Pearl Lee, Ripton, VT 05766. E-mail: bryan.alexander@nitle.org.

Students who write words on paper, yes—but who also compose words and images and create audio files on Web logs (blogs), in word processors, with video editors and Web editors and in e-mail and on presentation software and in instant messaging and on listservs and on bulletin boards—and no doubt in whatever genre will emerge in the next ten minutes. Note that no one is making anyone do any of this writing. (Yancey, 2004)

I BEGIN WITH AN ANECDOTE about understanding new media literacy that relates to a rare movie I found on the Web. Chris Marker released *La Jetee* in 1962, a pioneering science fiction film, whose narrative consisted entirely of a series of still images, photographs linked by a voiceover.¹ An important antecedent for digital storytelling, a groundbreaking experiment in using images as narrative, and a haunting meditation on memory, Marker's film was later used as inspiration for Terry Gilliam's *12 Monkeys* (1995). In January, 2007, I read a blog that mentioned the film.² Warren Ellis, writer and *Second Life* columnist for Reuters, had spotted *La Jetee* in a popular Web service, Google Video.

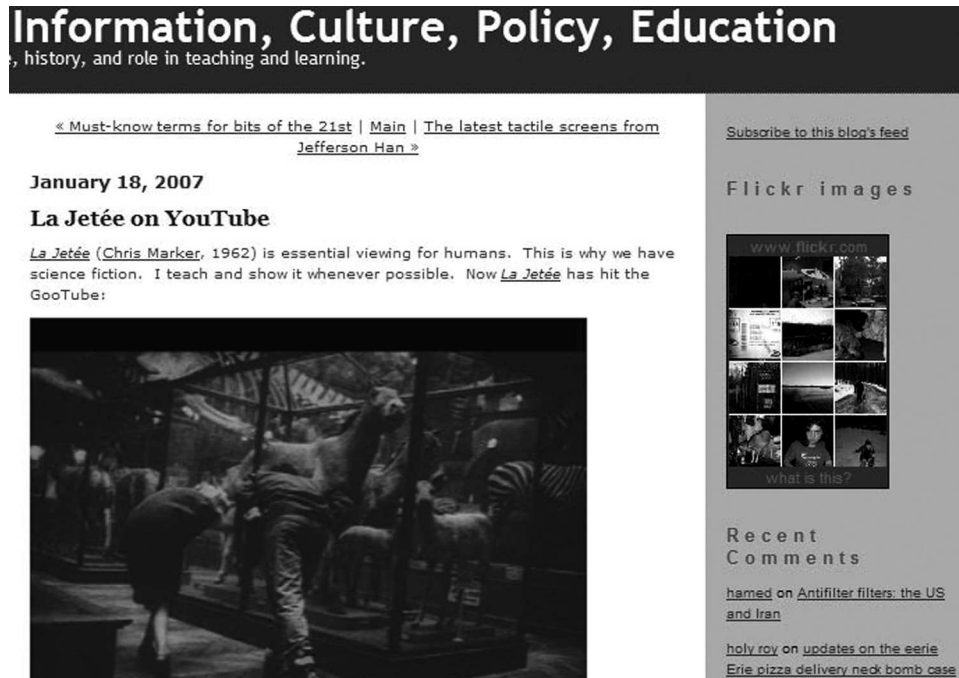


Figure 1. *La Jetee* at Infocult via YouTube and the blogosphere, January 2007.

Typical for a blog post, Ellis' entry included a link, commentary, and a sample of the content—an embedded video, displayed as a still image until clicked (see Figure 1). After Ellis' posted, readers commented, the entry was bookmarked in social services, and other bloggers discovered it through aggregators, blogrolls, and specialized search services (Technorati³). I tracked down the Google video copy and searched for other versions. YouTube featured a version with Spanish subtitles, along with one lacking any subtitles. All included the original spoken soundtrack in French and none were dubbed. I blogged this event, adding my own comments, including an image from and link to the video, intensifying networked discussion.

One can deduce several facts about this anecdote.⁴ The sequence of events consists of a distributed flow of videos, images, documents, pointers, and conversations, separated over time into discrete, addressable, and searchable chunks. Web 2.0 practices and technologies permeated the entire event. Web 2.0 is defined as a way

of creating Web pages focusing on microcontent and social connections between people. It also exemplifies that digital content can be copied, moved, altered, remixed, and linked, based on the needs, interests, and abilities of users—quite against the grain of both traditional and recently-expanded copyright. Furthermore, *La Jetee* is not a current film. Its reemergence in 2007, within networked computing structures, reflects Web 2.0's increasingly practiced long memory and the rising archival instinct of the Web. This example suggests pedagogical possibilities, many of which are currently being explored by teachers and students.

In American K–12 education, students increasingly accept these kinds of technology-driven information structures and the literacies that flow from them. As students live Web 2.0 digital lives, a growing number of teachers are beginning to explore and develop new ways of teaching with these technologies and practices. For example, concomitant online spaces are largely designed to segment and contain infor-

mation flows. Proprietary databases and content filters, offline software (CD-ROMs, games) are digital analogues for physical learning spaces. However, K–12 institutions are often behind, building classrooms constructed physically and socially along decades-old patterns.

What Is Web 2.0?

The term Web 2.0 offers a curious mix of stability and disorder. Tim O'Reilly (2005) coined it in 2005, virtually an eon in Internet time. The projects and platforms that O'Reilly described have grown rapidly, constituting a large swath of the World Wide Web. Conference postings, job descriptions, information architecture plans, and even TV news anchors use the term. New services have increased, many commanding large user bases. However, some Web pundits predict that the Web 2.0 period has peaked, to be followed by a Web 3.0, or Web 3d.⁵ The latter is beyond the scope of this article, but suggests an historical shift.

Few can agree on the term's definition, although many are quick to label (or denigrate) a project or movement as Web 2.0. The term often describes a heterogeneous mix of relatively familiar technologies and old practices. It encompasses the work of large corporations, along with exceedingly emergent ones. The mix suggests that the gap between Web 1.0 and 2.0 is not abyssal, but represents a conceptual shift accompanied by blurring and hybridity. For the purposes of this article, projects and practices labeled as Web 2.0 projects, must abide by a fairly coherent set of digital strategies.

Social software or *social networking* represents one such strategy. Although the term *social software* is relatively new, the idea dates as far back as Licklider's (1960, 1968) dream of using networked computing to connect people to boost their knowledge and ability to learn.⁶ The generation of Internet technologies following Licklider's initiative has often been profoundly social, connecting people around the world through tools as diverse as e-mail listservs, Usenet groups, bulletin boards, discussion software, groupware, and

Web-based virtual communities. More recently, a group of Web projects and services have greatly increased connectivity: blogs, wikis, podcasting, and videoblogs.⁷ An entire genre of Web services has emerged solely for connecting people to each other based on their interests and personality, including: Friendster, MySpace, FaceBook, and Flickr. The latter is built on sharing images and is an unheralded success in terms of the number of images shared and the level of community engagement.⁸

Blogs are a centerpiece to Web 2.0 taxonomy. Blogs are Web pages, or Web sites consisting of many pages. Their reverse-chronological structure implies a different rhetorical purpose than a Web page, which has no inherent timeliness. Blogs are devoted to frequent updates, sometimes several times per day. Readers can comment on most blogs, building and layering content to individual posts over time. The simplicity of creating and updating blogs empowers readers to write, evoking the phrase *read/write Web*. The practice of blogging grew over time to elicit a new form of audience, the blogging public, consisting of bloggers commenting on each other, fact-checking posts, and collaborating on projects.

A second component of Web 2.0 is *microcontent*. Microcontent is simply small content—small in terms of size and contributor effort. Wikis, for example, are streams of collaborative writing, bits and segments of conversation, revision, amendment, and truncation. Blogs are about a series of posts each contained within a page, not entire pages themselves (see Figures 2 and 3).⁹ Creating web content in either format does not require that the contributor build page layout, design menus, or develop a look and feel.

In a social photo service like Flickr, users easily upload pictures, comment, tag, and organize them into groups. Podcasts, although relatively large in terms of file size, are, in reality, user-friendly single chunks of sound. They are easily shuttled between Web sites, RSS feeds, and diverse player formats. Writing to someone's Facebook Wall requires only a login, keystrokes, and a one click save command. Obviously, it is much simpler to create microcontent than to build a Web site. Accessing microcontent



Figure 2. A sample blog post, from the *Radio Open Source* blog. The topic is images and captions.

involves identifying the microcontent asset, while situating within the context of larger project (a post within a blog, a single podcast within a series, etc.). Economist Benkler (2005) argues that academics are more likely to contribute many pieces of microcontent to a collective project than to work on a single item of larger content.

Experiencing Web 2.0 microcontent—looking at it, listening to it, reading it—usually occurs in the open Web. Most posters to social networking sites publish content for the world to see and use. The *blogosphere* is a platform for millions of people to write to a global audience. Educational content published in this way is open, contributing to a public field of knowledge. That content can be learning guides, journals of education, and opinion pieces about pedagogy. Openness explains both the rapid development of cross-linked microcontent projects, as well as the quantitative success of Web 2.0. Although openness remains a major theme of Web 2.0, ideologically and

technologically, some creators restrict viewers to a select group. For example, *LiveJournal* and *Flickr* allow users to define a friends-only circle and a number of wiki platforms permit users to lock down pages from the editing of others.

Social connection, openness, and microcontent combine into another Web 2.0 strategy—*social filtering*. Drawing on the wisdom of crowds, users contribute content to the work of others, leading to multiple-authored works, whose authorship grows over time. Creators comment on others' creations, allowing readers to triangulate between primary and secondary sources. This practice of social filtering has led to the advent of *folksonomies*.

Folksonomies consist of single words that users choose and apply to microcontent. In contrast, traditional metadata is usually hierarchical (topics nested within topics), structured (traditional library sanctioned metadata standards such as Dublin Core), and predetermined by

[Burger \(76\)](#)
[Israel and Lebanon: Three Views of a Regional War \(59\)](#)
[Lorraine Hunt Lieberman Remembered \(7\)](#)
[Sports as a Leading Indicator \(22\)](#)
[Transcendental Women \(32\)](#)
[Of Hand Counts and Voting Machines \(31\)](#)
[Korea: The Politics of the Peninsula \(23\)](#)
[The Good Death \(58\)](#)

Series
[Passion Thursday](#)
[Global Warming](#)
[Race and Class](#)

Lisa Goldman, Putting Things in Perspective, On the Face Blog, July 20, 2006

[RSS](#) [THIS POST](#)
[comment](#) | [trackback](#)
17 Responses to "The Right to Caption"

allison Says:
August 7th, 2006 at 7:33 pm
I think what's interesting about this 'democratizing' of captions is that we may learn one of two things, or both: which images are most important to people (that is, what they choose to publish when the newspaper editors don't have all the control) and/or the lowest common denominator of self-promotion (use the pornography of war to get attention for yourself or your cause.)

Can we tell yet, whether the public responds differently, better, worse, faster, more slowly to events around the world with all these images floating around?

rc21 Says:
August 7th, 2006 at 8:45 pm
Of course it would help if the images we were seeing were actually real. Reuters today acknowledged that it was showing doctored images of the bombing of Beirut. Conservative bloggers have also pointed out some major problems with photos taken in the past weeks that also appear to be doctored. The PM of Lebanon has just admitted today that only one person was killed in what was earlier called by the press another mass killing of civilians. And to top it off deaths from last weeks bombing have now been downgraded from over 60 to about 29. But why let the facts get in the way of a good story. Especially if it makes Israel look bad.

peggysue Says:
August 7th, 2006 at 11:45 pm
When I worked at the *Earth First! Journal* we had a picture of Al Gore hammering

Figure 3. Part of a discussion thread attached to that post.

content authorities (bibliographers, catalogers). For example, I photographed artwork created by children at a local middle school depicting American casualties in Iraq. I then uploaded several of these photos to Flickr.¹⁰ I added the tags *Ripton* and *memory*. Ripton is the name of the town in Vermont where the school is located, and memory labels the students' work as a memorial. A professional bibliographer would have added different terms, such as photography, school, Vermont, amateur, Second Iraq War, etc.

Folksonomies are powerful because users actually use them by willingly adding simple tags to documents. Folksonomies also succeed because of their social nature. As contributors tag, they have access to tags from other readers, which often influence their own choice of tags. In

the previous example, while browsing through related items in *Flickr*, I realized that adding the tag *Vermont* would be meaningful, because many people identified the community nature of art about Iraq with this small and progressive state. Later still, a news magazine writer asked to use one of the images, and recognizing how people generally tagged such images, I belatedly added the rather obvious term *Iraq*.

Many folksonomic tagging projects are available within the Web 2.0 environment. For example, folksonomic tags can be arranged into concept maps called *tag clouds*, which allows revisualization of information (see Figure 5). Social bookmarking innovator *del.icio.us* automatically reminds users of previously deployed tags, suggests new tags, and highlights tags used

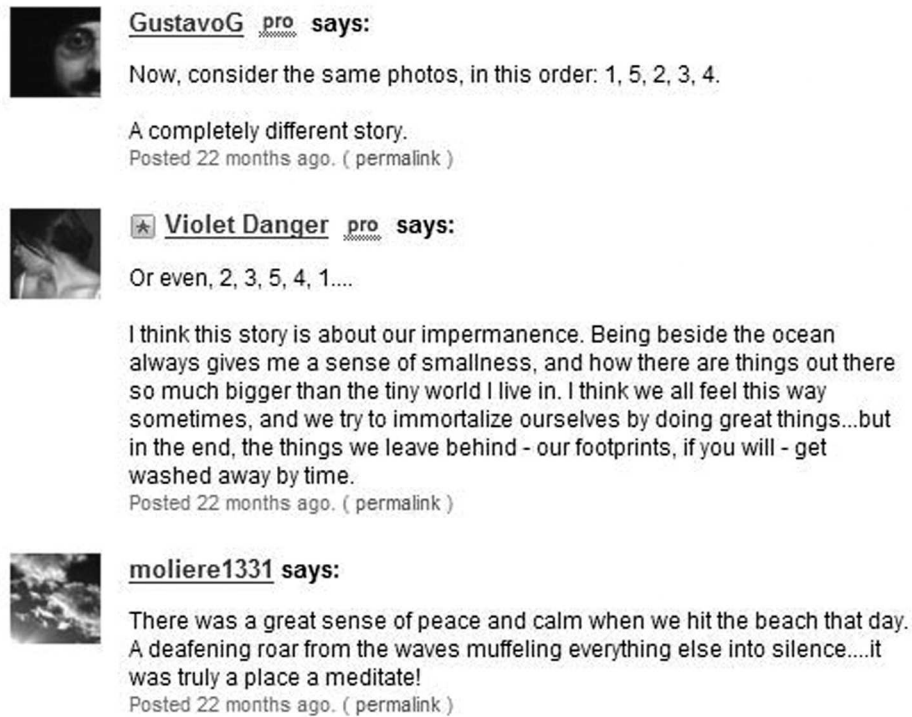


Figure 4. Discussion of a Flickr image series, "Alone with the Sand." Retrieved from <http://www.flickr.com/groups/visualstory/discuss/11969/>.



Figure 5. Tag cloud for one of the author's blogs, *Infocult*.

Mini Tag Cloud

2nd Law of thermodynamics A Life AI artificial
intelligence bioeconomics biology complexity
DARPA David Korten DNA **Ecology**
ecosystem ecosystems energy evolution
Farming feedback genetic engineering genetics
globalization IMF machine age machine metaphor
MIT mitochondria nanotechnology robotics Silvio
Gesell Sustainability thermodynamics

Figure 6. A sample tag cloud, for the nonfiction book *Pulse*.¹¹

by others. Tagging has rapidly spread through the Web, with corporations as diverse as Amazon.com and Google's G-mail encouraging and empowering users to tag books, emails, conversations, and folders.

Examining the tags attached to movie files, digital photographs, and podcasts reveals potentially useful information about the way that others perceive these objects, questioning audience, literacy, and reception (see Figure 6). Tagging may become a part of more general media literacy in the very near future, giving urgency to further research (Hammond, Hannay, Lund, & Scott, 2005; Lomas, 2005; Shirky, 2005). In a shift to a new form of virtual scholarship, educational researchers are publishing findings through social bookmarking sites, citing online readings and resources. In turn, students learn from their teachers' tagging strategies and, visa versa, teachers can view students' tagging to better understand the premise of their work.

This mix of openness and microcontent, social networking and filtering, is not new to education. Recent history draws on earlier practice. Teachers have been fascinated by the pedagogical possibilities of hypertext since the 1980s. Web 1.0, as it were, allowed students to read and create static hypertext documents. The open nature of Web 2.0 platforms, connected by hyperlinking, lets learners pursue connections across multiple lines of thought. The structure of blogs allows the learner

to search throughout the site, follow archives into the past, blogroll items towards affiliated sites, and access external links to references. Multiple browsers or tabs within a browser lets learners pursue multiple inquiries in rapid and almost sequential sequence.

Social bookmarking has pedagogical possibilities institutionally based on collaborative information filtering. A campus, school, or district can set up its own social bookmarking site, such as Penntags at the University of Pennsylvania, or H20 at Harvard. Because each bookmarked page is linked to the person who bookmarked it, a user can discover how others have assessed that content, and find people with related interests. Moreover, as multiple learners can share a single account, and/or form a group of individual accounts, social services can support team projects, with each member contributing resources over time. As each team member tags, individual perspectives surface within the collective. Additionally, social bookmarking can be quite personal, serving as what some call an *outboard memory*. One's bookmark site remembers pages that otherwise can be lost among a welter of browsers, computers, notes on paper, and the full complexity of the modern, networked desktop.

This hyperconnected universe is far-reaching and global. Web 2.0 platforms have become enormously popular around the world. Bloggers receive comments from bloggers of every nationality. Wikipedia debates across frontiers. Blogosphere-wide search engines scan the *live Web*, constantly updating the network of recently added microcontent. Technorati, Icerocket, Feedster, Daypop, Waypath, BlogPulse, Google Blogsearch, and Yahoo's equivalent help users track conversations around the world, partaking in distributed arguments, identifying and debating multiple points of view.

Students partaking of this rich international conversation find themselves catapulted beyond the physical boundaries of the classroom or library. Moreover, writing for a global audience is a powerful stimulus for questioning personal identity, representing oneself through writing, and understanding an audience.

Web 2.0 Meets the Blackboard Web

The emergence of Web 2.0 coincided with the creation and educational adoption of the modern online course management system, or CMS.¹² Wikis date back to the late 1990s (Socialtext, 2006), and blogs, in their current form, gained popularity in and around 2000–2001. CMSs drew from some Web 2.0-affiliated wellsprings, such as discussion boards and sharing documents asynchronously. Angel, Prometheus, WebCT, Blackboard, Desire2Learn, Moodle, Sakai, and others became market players, competing for an ever-growing share of global education's interest. Most of the vendors have focused on higher education and distance learning, with the exception of the open source Moodle, which seems to have won audiences in nearly every educational niche.

As Web 2.0 and CMSs gained popularity, differences became obvious. First, most CMSs restrict social networking to an individual, discrete class. This limitation exists in space as well as time, with the digital content of a class focused on an instructor and their section, and only for the duration of the course. Although some CMSs support publication to the open Web, this is not a major adoption point. Second, CMSs support hyperlinking differently than Web 2.0. Communication tools such as discussion tools, blogs, and wikis usually serve single class instances. Although content creators within a CMS can easily link to the outside Web, the reverse is not true, because inbound links are blocked by the CMS server. The resulting hypertext literacy is quite different, as CMS users do not learn to deal with inbound links, or comments from the public. Web 2.0 creators, in contrast, grapple with the world audience every day.

Students increasingly inhabit both of these worlds. Most have authored content to the Web in Web 2.0 projects, as cited in the *Pew Internet and American Life Study* (Pew, 2005). K–12 and higher education institutions are aware of the huge popularity of social networking leaders MySpace and Facebook. Students increasingly consult Wikipedia for research, to the consternation of some teachers.¹³ At the same time, students increasingly experience class work

through a CMS framework. The daily life of a student is, therefore, an amphibious experience, alternating between these two realms, tracking *La Jetee* around the world, as with the opening example, and checking in with peers anytime and anywhere.

What one can learn from the differences between CMS and Web 2.0 is that students working in both worlds are capable of being digitally flexible. One also can conclude that some skills learned in one world cannot be applied to the other. Searching the blogosphere for recent commentary on a genetic engineering scandal is not something easily accomplished within a CMS. Furthermore, the rhetorical habit of speaking to a single, stable group with whom one spends a great deal of face-to-face time is not altogether applicable to a Flickr global audience. Even a Web 2.0 closed group is not the same, because the student, rather than the campus registrar, sets boundaries and modifies them over time.

Paramount to this discussion is that students are developing dual digital literacies in the modern networked environment. Consider the radically different experience of fulfilling an assignment in a CMS, as opposed to solving a problem using the open Web. In the first case, the student operates within the classroom, following the teacher's selection, and is not necessarily aware of context. In the second, the student digitally transcends the class, skipping between a rich mix of links and resources. On the Web there are internal links, navigational menus, advertisements perhaps, and a URL to explore and critique. In both cases, students can conduct research, *Googling* for links and context. But the second case is more complex and requires higher order critical thinking skills. In the process of searching for material through a search engine like Google, the student is faced with choices about how to sift through documents, assess the quality and credibility of information, and make decisions about intellectual property.

Furthermore, the open Web provides far more opportunities for the student to write. In a CMS, a student might post a question to the discussion board. But Web 2.0 leads to blogging about a document, commenting on someone else's

posting, perhaps contributing and/or editing a wiki entry on the subject, or bookmarking and annotating results to share with others. The literacy requirements for such searches are very complex, shift rapidly, and require new skills that encompass a more worldly, public literacy.

As discussed previously, Web 2.0 platforms are increasingly global. Evidence for this is plentiful, from the large number of *Wikipedia* languages¹⁴ to the huge number of South Koreans contributing to the CyWorld social networking service (*Business Week*, 2005). The majority of Flickr users are from outside of the United States (Dash, 2006). As Internet usage continues to grow, especially as expanded by mobile phone usage, the Web 2.0 world will continue to increase. In contrast, the CMS classroom will languish in localization.

Last, this double literacy of CMS and Web 2.0 will accompany learners throughout their life-long learning. There are many *walled gardens* in the digital world, such as banking programs, proprietary databases, and institutional intranets. The ability to shift modes from open to closed networks is a multimodal literacy already flourishing in schools and homes. When, for example, does one share a discussion or image from a CMS with someone outside the class? How does one maintain conversations on either side of a password barrier? Answering such questions requires identifying and modeling on the behavior of others, testing out options, and learning from peers—in short, developing a literacy practice. This is the future of information literacy, which the *American Library Association* predicted almost 20 years ago.¹⁵

Web 2.0 Meets Gaming

Although Web 2.0 has grown enormously in recent years, it is dwarfed in user base and financial heft by the computer gaming industry. Depending on which study one cites, gaming has made more money than the Hollywood film industry for several years, and may have also topped sales in the music industry. After a slump in the early 1990s, gaming has boomed over the

past decade. Like Web 2.0, gaming is global. Similar to the CMS, many games are closed systems. For example, software for the Nintendo Wii only plays on that platform, and game development is a highly proprietary and strictly licensed.

That connection between Flickr, a Web 2.0 phenomena, and gaming has historical association that further informs one about these technologies and their related literacies. The photo-sharing site Flickr was not originally designed for that purpose. Instead, the project team initially was charged with developing a massively multiplayer online game (MMOG), titled *Game Neverending*. That game never reached full roll-out, but designers noticed that test players enjoyed sharing objects and tagging them; hence, Flickr emerged from this realization (Graham, 2006).¹⁶

Gaming is quite distinct from Web 2.0. High-profile games are far removed from microcontent, created by corporations bankrolling large design and production teams. Yet even the most daunting games generate content, which can then be shared socially. *Machinima* is one example, in which gamers create videos using gaming tools to stage scenes. Some games, like *The Movies* (Lionhead), enable this natively. Others offer enough flexibility to let users stage scenes using third party software, such as *Red vs. Blue* and *This Spartan Life*, in which users build comedy and interview shows (Jenkins, 2006).

Linden Lab's Second Life virtual world provides still more flexibility in creating interaction though visual content. Although Second Life is considered an immersive environment, rather than a game, players represent themselves through highly personalized avatars and can create three-dimensional objects, structures, and spaces. Academic versions, such as Open Croquet, use the 3d experience to organize documents and information. Some believe that technology constitutes an emergence of Web 3d, or a three-dimensional version of Web 2.0.

Research on gaming and literacy has already been revolutionized by the work of James Paul Gee (Self & Hawisher, 2007). Game content constitutes an increasing proportion of the in-

formational world, especially as experienced by K–16 students. In the classic terms of information fluency, teachers must learn how to assess the value of information presented in a game and teach students to think critically about these social simulations.

In conclusion, educators inhabiting the world of the new net.generation must revamp and extend their prior technology skills to address new literacies requisite of a Web 2.0 world. At the same time, students must maximize their experiences within the constrained classroom environment as exemplified by the use of the CMS, the Web 2.0 with its taxonomy of social networks, and sensory rich gaming environments to develop a multilevel literacy, an amphibious skill in moving between enclosure and World.

Notes

1. One image is actually moving, a shot of the main female character breathing, several seconds long.
2. A blog is a Web site made up of many short content chunks, called posts, arranged in reverse chronological order. I read the blog Web through Bloglines, an RSS reader. RSS stands for Really Simple Syndication, an easy way of reading and aggregating information from news feeds, blogs, or other updated sources.
3. *Technorati* searches the Web for blogs, referred to as the blogosphere.
4. Starting with <http://www.warrenellis.com/?p=3547> and ending with http://infocult.typepad.com/infocult/2007/01/la_jete_on_yout.html.
5. Web 3.0 sometimes refers to the application of the semantic Web. It is Sir Tim Berners-Lee's recommendation for improved Web page metadata. Web 3d describes using virtual environments, like Second Life, to experience the Web.
6. See Howard Rheingold's description, <http://www.rheingold.com/texts/tft/7.html>
7. Wikis are Web pages that any user can edit in their browser. Podcasts are digital audio files, usually in a series, which people can download through various applications. Videoblogs are blogs that include movies as content.
8. <http://www.flickr.com/>. Flickr's success has spawned a series of social image services, such as *PhotoBucket* and *23hq*.
9. Blog software automatically renders each post—and each comment—as a separate page. The user is responsible only for the content chunk, the blog post, located within, but not constituting, the majority of content of that page.
10. <http://www.flickr.com/photos/bryanalexander/349743048/>
11. Screenshot may be accessed at: <http://www.pulsethebook.com/index.php>
12. In Europe often referred to a Virtual Learning Environment, or VLE.
13. For example, Middlebury College's history department's recent and widely discussed decision to ban Wikipedia from final paper and exam citation.
14. To date, in Wikipedia fourteen languages have more than 100,000 articles each. See http://meta.wikimedia.org/wiki/List_of_Wikipedias.
15. <http://www.ala.org/ala/acrl/acrlissues/acrlinfo/it/informationliteracy.htm>
16. Cf. of course, this Wikipedia entry: http://en.wikipedia.org/wiki/Game_Neverending.

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